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| 10/646,810 | 08/25/2003 | Naoki Imachi | SNY-039 | 1318 |
| 20374 7590 10/21/2008 KUBOVCIK & KUBOVCIK SUITE 1105 1215 SOUTH CLARK STREET ARLINGTON, VA 22202 | | | | |
| EXAMINER CHU, HELEN OK | | | | |
| ART UNIT | | PAPER NUMBER | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/646,810

Applicant(s)

IMACHI ET AL.

Examiner

Helen O. Chu

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

DETAILED ACTION

1. Applicant's Amendment was received on September 16, 2008. Claim 1 has been amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 16, 2008 has been entered.

Claim Rejections - 35 USC § 102/103

4. The rejections under 35 U.S.C 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yoshimura et al., on claims 1-4, 9-12 are withdrawn because the Applicants amended the claims.
5. The rejections under 35 U.S.C 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kim et al., on claims 1-4, 9-12 are maintained.
6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-4, 9-12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Simon et al. (US Patent 5,626,981).

In regard to claim 1-4, 9-12, the Simon et al. reference discloses a lithium secondary battery with a negative electrode comprising carbon (1:1-5), positive electrode, a polyethylene separator (4:1-5) and a nonaqueous mixed organic solvent including two or more of the first solvent (Example 1) that is selected from gamma-butyrolactone and ethylene carbonate (3:10-16) and a second solvent group such as dioxolane (3:17-25). Furthermore, since the wettability improving agent is the same as that of the Applicant's invention, the physical properties and characteristics must inherently be the same as the Applicant's invention such as an oxidative decomposition potential in a range of 4.5 V to 6.2 V based on the potential of a lithium reference electrode, oxidative decomposition potential of the wettability improving agent is smaller than that of the nonaqueous solvent and reductive decomposition potential of the wettability improving agent is not greater than 0.0 V. Furthermore, the Simon et al.

reference discloses that the electrolytes can have a lithium salt added to the salts (3:30-36)

8. Claims 1-4, 9-12 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kim et al. (US Publication 2003/0073005 A1).

In regard to claim 1-4, 9-12, the Kim et al. reference discloses a lithium secondary battery (Paragraph 5) with a negative electrode comprising carbon (Paragraph 51), positive electrode, a polyethylene separator (Paragraph 55) and a nonaqueous mixed organic solvent including two or more of the organic compounds (Paragraph 36) from a strong polar solvent groups such as gamma-butyrolactone and ethylene carbonate (Paragraph 41) and a lithium protecting solvent group such as dioxolane (Paragraph 42). Furthermore, since the wettability improving agent is the same as that of the Applicant's invention, the physical properties and characteristics must inherently be the same as the Applicant's invention such as an oxidative decomposition potential in a range of 4.5 V to 6.2 V based on the potential of a lithium reference electrode, oxidative decomposition potential of the wettability improving agent is smaller than that of the nonaqueous solvent and reductive decomposition potential of the wettability improving agent is not greater than 0.0 V. Furthermore, the Kim et al. reference discloses that the electrolytes can have a lithium salt added to the salts (P34)

Claim Rejections - 35 USC § 103

9. The rejections under 35 U.S.C 103(a) as obvious over Yoshimura et al., on claims 5-8, 13-16 are withdrawn because the Applicants amended the claims
10. The rejections under 35 U.S.C 103(a) as unpatentable over Kim et al. (US 2003/0073005 A1), on claim 5-8, 13-16 are maintained. The rejection is repeated below for convenience.
11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
12. Claims 5-8, 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (US 2003/0073005 A1).

The Kim et al. reference discloses the invention above and further incorporated herein. The Kim et al. reference also discloses a dioxolane is used between 0-30% by volume of the total electrolyte. It would have been obvious to one of ordinary skill to vary the mass ratio of different solvents such as 0% of dioxolane or even under 3% mass ratio of the total electrolyte solvents to choose the instantly claimed value through process optimization, since it has been held that the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable values involve only routine skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Furthermore, it would be inherent that the reductive decomposition potential of the wettability improving agent is no greater than 0.0V because this is only a reference

state. In addition, since the secondary battery is the same battery as the instantly claimed invention, the intrinsic properties of the wettability agent must also be the same, that is 1,3-dioxolane has a decomposition potential of 4.5-6.2 V or 4.8 - 5.2 V.

Response to Arguments

Applicant's arguments filed September 16, 2008 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

A) The Applicant argues in regards to Yoshimura has been considered but are moot in view of the withdrawal of the rejection.

B) The Applicants argue, "Second, regarding Kim, as noted above, the solute of the nonaqueous electrolyte of the present invention has been limited to a lithium-containing salt. This amendment distinguishes over the battery of Kim because the battery of Kim requires, as an electrolyte, a salt having an organic cation that is capable of dissolving sulfur-based positive active material. Kim describes on page 2, paragraph [0028], that ~[t]he salts having the organic cation do not contain lithium ions." Kim cannot be properly modified to obtain the lithium secondary battery because such modification will destroy the invention on which Kim is based and is improper. See *Ex parte Hartmann*, 186 USPQ 366 (Bd. App. 1974)" However, the Applicants did not fully read the disclosure of Paragraph 34 which states "Although the electrolyte of a lithium sulfur battery may use only salts having the organic cations, the electrolyte according to another embodiment of the present invention uses a mixture in which a solid-phase lithium salt is added to the salts. The lithium salt can include any lithium salt

that is conventional lithium salts to be added to an electrolyte for batteries. Some examples include, but are not limited to LiPF_6 (etc.)"

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Patrick Ryan can be reached on (571) 272-12922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HOC

/PATRICK RYAN/

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Supervisory Patent Examiner, Art Unit 1795